SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING
1.1 Product information

Commercial name: MHHPA-KB
Trade Name: MHHPA-KB
EC Number: Mixture
CAS Number: Mixture

1.2 Relevant identified uses of the substance or mixture and uses advised against

Industrial use as an intermediate in chemical synthesis or process
Industrial use as a hardener for epoxy resins
Industrial use as a monomer in the manufacture of resins
Manufacture of substance (liquid and flakes)

1.3 Details of the supplier of the safety data sheet

Dixie Chemical
Phone: 281-474-3271
Email: msds@dixiechemical.com

REACCh ChemAdvice GmbH
Am Marktplatz 5 - 65779 Kelkheim (Taunus) - Germany
Tel.: +49 (0) 6195 96199 14
Fax: +49 (0) 6195 96199 33
E-mail address: rudolf.staab@reach-chemadvice.com

1.4 Emergency telephone number

Information (281) 474-3271
Chemtrec (800) 424-9300

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to EU Directives 1272/2008
MHHPA
Eye Damage 1-H318: Causes serious eye damage.
Resp. Sensitizer- H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin Sensitizer1 -H317: May cause an allergic skin reaction.

Proprietary Catalyst- Self classification

MHHPA-KB SDS
Acute Toxicity 4- H332- Harmful if inhaled
Skin Irritant 2 H315- Causes skin irritation
Eye Irritant 2 H319- Causes serious eye irritation

2.1.2 Classification according to Directive 67/548/EEC

Xi - Irritant; R41 - Risk of serious damage to eyes.
Xn - Harmful; R42/43 - May cause sensitization by inhalation and skin contact.

2.2 Label elements

2.2.1 Labeling according to Regulation (EC) 1272/2008
Signal word: Danger
Hazard pictogram:
GHS08: health hazard
GHS05: corrosion

Hazard Statement(s): (Primary Component)
    H317: May use an allergic skin reaction
    H318: Causes serious eye damage
    H334: May cause allergy or asthma symptoms or breathing difficulty if inhaled

Precautionary Statement(s):
    P261 Avoid breathing dust/fume/gas/mist/vapours/spray
    P280 Wear protective gloves/protection clothing/eye protection/face protection
    P304+P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
    P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
    P310 Immediately call a POISON CENTER or doctor/physician

2.3 Other hazards
No other known.
For PBT and/or vPvB see section 12.5

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Mixtures
<table>
<thead>
<tr>
<th>CAS/EU number/REACH Registration Number</th>
<th>Chemical name of the substance</th>
<th>Concentration</th>
<th>Classification according to Regulation (EU) 1272/2008(CLP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25550-51-0/247-094-1/01-2119845474-33-XXXX</td>
<td>Methylhexahydropthalic anhydride</td>
<td>&gt;94%</td>
<td>Eye Damage 1-H318: Resp. Sensitizer- H334: Skin Sensitizer1 -H317:</td>
</tr>
<tr>
<td>Proprietary</td>
<td>Proprietary Catalyst</td>
<td>&lt; 5%</td>
<td>Skin Corrosion / Irritation Hazard Category 1Bserious Eye Damage / Eye Irritation Hazard Category 1Aquatic Environment Acute Hazard Category 1Aquatic Environment Chronic Hazard Category 1</td>
</tr>
</tbody>
</table>

Further information
For the full text of the H-Statements mentioned in this Section, see Section 16.
For the full text of the R-phrases mentioned in this Section, see Section 16.

### 4. FIRST AID MEASURES

#### 4.1 Description of first aid measures

**Inhalation:**
Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. If symptoms persist, call a physician.

**Skin:**
After contact with skin, wash immediately with plenty of soap and water. Consult a physician.

**Eye:**
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Call a physician immediately.

**Ingestion:**
Call a physician immediately. Clean mouth with water and drink afterwards plenty of water. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

#### 4.2 Most important symptoms and effects, both acute and delayed
There is no data available for this product.

4.3 Indication of immediate medical attention and special treatment needed, if necessary
See Section 4.1

5. FIRE-FIGHTING MEASURES
5.1 Extinguishing media
Extinguishing media : Water spray
Carbon dioxide (CO2)
Alcohol-resistant foam

Unsuitable : High volume water jet
extinguishing media

5.2 Hazardous combustion products: Carbon dioxide and carbon monoxide may form by combustion. In contact with hot water may form phthalic acid

5.3 Special protective actions for fire-fighters
Wear self-contained breathing apparatus and protective suit.

5.4 Specific methods
In the event of fire, cool tanks with water spray. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Move any people not authorized to contain the emergency out of the area. Avoid coming in contact with the substance or handling containers without adequate protection. Use the personal protective equipment described in section 8. Use a respirator in the event of emissions/spillage of large quantities. Eliminate all sources of ignition. Remove all incompatible materials as outlined in section 10.5 of SDS. Avoid dust formation.

6.2 Environmental precautions
Try to prevent the material from entering drains or water courses. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and materials for containment and cleaning up
Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13). After cleaning, flush away traces with water.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
MHHPA-KB SDS
Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. For personal protection see section 8.

7.2 Conditions for safe storage, including any incompatibilities

Eliminate all sources of combustion.
Keep container hermetically closed in a dry and well ventilated environment.
Do not store near heat sources or expose to direct sunlight, to preserve the quality of the product.
Keep away from incompatible materials (see point 10.5).
Keep away from food, feed and beverages.

7.3 Specific end uses
None

8. EXPOSURE CONTROLS/PERSONAL PROTECTION
8.1 Exposure Limit Values

Toxicological information
The following table shows exposure values, DNELs and risk characterisation ratios (RCRs). RCRs were calculated using most conservative DNELs and highest estimated exposure concentrations. Only long term exposures were considered. RCR calculation was limited to systemic effects, as no local toxicity was observed. Overall, derived RCRs can be considered worst-case.

Quantitative risk characterization for workers (Use 1 Formulation use)

<table>
<thead>
<tr>
<th>Route</th>
<th>ES 1-exposure concentrations (EC)</th>
<th>Leading toxic end point / Critical effect</th>
<th>DNEL</th>
<th>Risk characterisation ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute - systemic effects</td>
<td>Dermal</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Combined routes</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Acute - local effects</td>
<td>Dermal</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Long-term - systemic effects</td>
<td>Dermal</td>
<td>5.4857 mg/kg bw/d</td>
<td>Repeated dose</td>
<td>90 mg/kg bw/d</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td>7.01 mg/m³</td>
<td>Repeated dose</td>
<td>79.3 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Combined routes</td>
<td>6.4868 mg/kg bw/d</td>
<td>Repeated dose</td>
<td>--</td>
</tr>
<tr>
<td>Long-term - local effects</td>
<td>Dermal</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

For Use 1 Formulation use and associated exposure scenarios highest estimated exposure concentrations were below derived DNEL-values for all individual and combined exposures, resulting in RCRs below one (<1).

Conclusion
(i) The substance is of no immediate concern to humans (workers).

(Semi) Quantitative risk characterization for humans exposed via the environment

<table>
<thead>
<tr>
<th>ERC</th>
<th>Route</th>
<th>ES 1- exposure concentrations (EC)</th>
<th>Leading toxic end point / Critical effect</th>
<th>DNEL</th>
<th>Risk characterisation ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Dermal - systemic (acute or long term)</td>
<td>3.62E-10 mg/kg bw/day</td>
<td>Repeated dose toxicity</td>
<td>45 mg/kg bw/day</td>
<td>8.04E-12</td>
</tr>
<tr>
<td>2</td>
<td>Inhalation - systemic (long term)</td>
<td>9.72E-04 mg/m³</td>
<td>Repeated dose toxicity</td>
<td>19.6 mg/m³</td>
<td>4.96E-05</td>
</tr>
<tr>
<td>2</td>
<td>Oral - systemic (long term)</td>
<td>3.06E-04 mg/kg bw/day</td>
<td>Repeated dose toxicity</td>
<td>45 mg/kg bw/day</td>
<td>6.80E-06</td>
</tr>
<tr>
<td>2</td>
<td>Combined routes</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>5.64E-05</td>
</tr>
<tr>
<td>3</td>
<td>Dermal - systemic (acute or long term)</td>
<td>3.62E-10 mg/kg bw/day</td>
<td>Repeated dose toxicity</td>
<td>45 mg/kg bw/day</td>
<td>8.04E-12</td>
</tr>
<tr>
<td>3</td>
<td>Inhalation - systemic (long term)</td>
<td>0.0114 mg/m³</td>
<td>Repeated dose toxicity</td>
<td>19.6 mg/m³</td>
<td>5.82E-04</td>
</tr>
<tr>
<td>3</td>
<td>Oral - systemic (long term)</td>
<td>3.55E-03 mg/kg bw/day</td>
<td>Repeated dose toxicity</td>
<td>45 mg/kg bw/day</td>
<td>7.89E-05</td>
</tr>
<tr>
<td>3</td>
<td>Combined routes</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>6.61E-04</td>
</tr>
</tbody>
</table>

For Use 1 Formulation and associated exposure scenarios highest estimated exposure concentrations were below derived DNEL-values for all individual and combined exposures, resulting in RCRs below one (<1).

**Conclusion**

(i): The substance is of no immediate concern to humans indirect exposed via the environment.

**8.2 Exposure controls**

**8.2.1 Appropriate engineering controls**

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product. Remove and wash contaminated clothing before re-use. Avoid contact with skin, eyes and clothing. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation.

**8.2.2 Individual protection measures, such as personal protective equipment**

**Hand protection**

Glove material: Nitrile rubber

Glove material: Neoprene gloves
Glove material: PVC

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Eye protection
   Safety glasses with side-shields
Skin and body protection
   Protective clothing. Safety shoes
Respiratory protection
   In case of inadequate ventilation for solid THPA, utilize approved respiratory protection for dust. For molten THPA, utilize approved respiratory protection for organic vapor and dust.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

General Information (appearance, odor)

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Clear to light yellow</td>
</tr>
<tr>
<td>Odor</td>
<td>Characteristic odor</td>
</tr>
</tbody>
</table>

Important health safety and environmental information

Boiling Point: 291°F (144°C) @ 17 mm Hg
Melting Point: <5°F(<-15°C)
Volatile/Vol (%): N.E.
Vapor Pressure (mm Hg): N.E.
Vapor Density (Air = 1): N.E.
Solubility in H₂O: Reacts slowly with water
Appearance/Odor: Clear, colorless, viscous liquid / Irritating odor when hot.
Specific Gravity (H₂O = 1): 1.17
Evap. Rate (Butyl Acetate = 1): N.E.
Flash Point: 343°F (173°C) PMCC, ASTM D93
Lower Explosive Limit: N.E.
Upper Explosive Limit: N.E.
Autoignition Temperature: N.E.

9.2 Other data

10. STABILITY AND REACTIVITY

10.1 Reactivity
Stable

10.2 Chemical stability
Stable under normal conditions.
10.3 Possibility of hazardous reactions

Hazardous reactions : None known.

10.4 Conditions to avoid

Conditions to avoid : Incompatibles and excessive temperatures.

10.5 Incompatible materials

Materials to avoid : Alcohols, acids, bases, and oxidizers. Heat and / or water will affect product quality.

10.6 Hazardous decomposition products

Thermal decomposition : Note: no data available

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Corrected dose descriptor(s) per endpoint and endpoint-specific DNELs for the relevant exposure pattern
<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Route</th>
<th>Most relevant quantitative dose descriptor (appropriate unit)</th>
<th>Corrected dose descriptor (appropriate unit)</th>
<th>Overall AF applied</th>
<th>Endpoint-specific DNEL (appropriate unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Loc al Systemic</td>
<td>Local Systemic Worker / General population</td>
<td>Worker / General population</td>
<td>Local Worker / General population Systemic Worker / General population</td>
</tr>
<tr>
<td>Acute toxicity</td>
<td>oral</td>
<td>-- LD50 &gt; 2000 mg/kg bw/day</td>
<td>-- 2000 mg/kg bw/day</td>
<td>--</td>
<td>Not relevant</td>
</tr>
<tr>
<td></td>
<td>dermal</td>
<td>-- LD50 &gt; 2000 mg/kg bw/day</td>
<td>-- 2000 mg/kg bw/day</td>
<td>--</td>
<td>Not relevant</td>
</tr>
<tr>
<td></td>
<td>inhalation</td>
<td>-- --</td>
<td>-- --</td>
<td>--</td>
<td>Not relevant</td>
</tr>
<tr>
<td>Irritation/Corrosivity</td>
<td>skin</td>
<td>-- NA</td>
<td>-- NA</td>
<td>--</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>eye</td>
<td>-- NA</td>
<td>-- NA</td>
<td>--</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>resp. tract</td>
<td>-- NA</td>
<td>-- NA</td>
<td>--</td>
<td>NA</td>
</tr>
<tr>
<td>Sensitisation</td>
<td>skin</td>
<td>-- NA</td>
<td>-- NA</td>
<td>--</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>resp. tract</td>
<td>-- NA</td>
<td>-- NA</td>
<td>--</td>
<td>NA</td>
</tr>
<tr>
<td>Repeated dose toxicity</td>
<td>oral</td>
<td>-- NOAEL = 450 mg/kg bw/day (nominal)</td>
<td>-- 450 mg/kg bw/day</td>
<td>10</td>
<td>45 mg/kg bw/day</td>
</tr>
<tr>
<td>sub-acute/ sub-chronic/ chronic</td>
<td>dermal</td>
<td>-- NOAEL = 450 mg/kg bw/day (nominal)</td>
<td>-- 450 mg/kg bw/day</td>
<td>5 / 10</td>
<td>90 mg/kg bw/day / 45 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>inhalation</td>
<td>-- NOAEL = 450 mg/kg bw/day (nominal)</td>
<td>-- 396.5 mg/m³ / 196 mg/m³</td>
<td>5 / 10</td>
<td>79.3 mg/m³ / 19.6 mg/m³</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>in vitro</td>
<td>NA Not mutagenic</td>
<td>NA Not mutagenic</td>
<td>--</td>
<td>NA Not mutagenic</td>
</tr>
<tr>
<td></td>
<td>in vivo</td>
<td>-- --</td>
<td>-- --</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>oral</td>
<td>-- --</td>
<td>-- --</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>dermal</td>
<td>-- --</td>
<td>-- --</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>inhalation</td>
<td>-- --</td>
<td>-- --</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>oral</td>
<td>-- Parental NOAEL = 450 mg/kg bw/day</td>
<td>NA 450 mg/kg bw /day</td>
<td>--</td>
<td>NA Not relevant</td>
</tr>
<tr>
<td>fertility impairment</td>
<td>dermal</td>
<td>NA</td>
<td>NA</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>inhalation</td>
<td>NA</td>
<td>NA</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>oral</td>
<td>-- Offspring (F1) NOAEL = 450 mg/kg bw/day</td>
<td>NA 450 mg/kg bw /day</td>
<td>--</td>
<td>NA Not relevant</td>
</tr>
<tr>
<td>developmental</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Endpoint | Route | Most relevant quantitative dose descriptor (appropriate unit) | Corrected dose descriptor (appropriate unit) | Overall AF applied | Endpoint-specific DNEL (appropriate unit) |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>tox</td>
<td>dermal</td>
<td>NA NA</td>
<td>NA NA</td>
<td>--</td>
<td>NA --</td>
</tr>
<tr>
<td></td>
<td>inhalation</td>
<td>NA NA</td>
<td>NA NA</td>
<td>--</td>
<td>NA --</td>
</tr>
</tbody>
</table>

### DNELs for workers

<table>
<thead>
<tr>
<th>Exposure pattern</th>
<th>Route</th>
<th>Descriptors</th>
<th>DNEL (appropriate unit)</th>
<th>Most sensitive endpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute - systemic effects</td>
<td>Dermal</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Acute - local effects</td>
<td>Dermal</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Long-term - systemic effects</td>
<td>Dermal</td>
<td>NOAEL</td>
<td>90 mg/kg bw/day</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td>NOAEL</td>
<td>79.3 mg/m³/day</td>
<td>--</td>
</tr>
<tr>
<td>Long-term – local effects</td>
<td>Dermal</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

### Specific Target Organ Toxicity (STOT) - single exposure: NOT AVAILABLE

### Specific Target Organ Toxicity (STOT) - repeated exposure: NOT AVAILABLE

### Hazardous if inhaled: NOT AVAILABLE

### 12. ECOLOGICAL INFORMATION

#### 12.1 Ecotoxicity effects

**Short-term toxicity to fish:**

<table>
<thead>
<tr>
<th>Method</th>
<th>Results</th>
<th>Remarks</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Oncorhynchus mykiss</em> freshwater static EU Method C.1 (Acute Toxicity for Fish) OECD Guideline 203 (Fish, Acute Toxicity Test)</td>
<td>LC50 (24 h): &gt; 100 mg/L test mat. (nominal) LC50 (48 h): &gt; 100 mg/L test mat. (nominal) LC50 (72 h): &gt; 100 mg/L test mat. (nominal) LC50 (96 h): &gt; 100 mg/L test mat. (nominal)</td>
<td>1 (reliable without restriction) key study experimental result read-across from supporting substance (structural analogue or surrogate) Test material 4-MHHPA</td>
<td>Scheerbaum D. (2010)</td>
</tr>
</tbody>
</table>
### Short-term toxicity to aquatic invertebrates

<table>
<thead>
<tr>
<th>Method</th>
<th>Results</th>
<th>Remarks</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Daphnia magna</em> freshwater static EU Method C.2 (Acute Toxicity for Daphnia) OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)</td>
<td>EC50 (24 h): &gt; 100 mg/L test mat. (nominal) based on: mobility EC50 (48 h): &gt; 100 mg/L test mat. (nominal) based on: mobility</td>
<td>1 (reliable without restriction) key study experimental result read-across from supporting substance (structural analogue or surrogate)</td>
<td>Noack M. (2010)</td>
</tr>
</tbody>
</table>

### Toxicity to aquatic algae and cyanobacteria:

<table>
<thead>
<tr>
<th>Method</th>
<th>Results</th>
<th>Remarks</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Pseudokirchnerella subcapitata</em> (algae) freshwater static EU Method C.3 (Algal Inhibition test) OECD Guideline 201 (Alga, Growth Inhibition Test)</td>
<td>EC50 (72 h): 135 test mat. (nominal) based on: growth rate EC50 (72 h): 81.3 test mat. (nominal) based on: biomass NOEC (72 h): 32 mg/L test mat. (nominal) based on: growth rate NOEC (72 h): 32 test mat. (nominal) based on: biomass LOEC (72 h): 100 test mat. (nominal) based on: growth rate LOEC (72 h): 100 test mat. (nominal) based on: biomass EC10 (72 h): 77.5 test mat. (nominal) based on: growth rate EC10 (72 h): 42 test mat. (nominal) based on: biomass EC20 (72 h): 95.7 test mat. (nominal) based on: growth rate EC20 (72 h): 57.3 test mat. (nominal) based on: biomass</td>
<td>1 (reliable without restriction) key study experimental result read-across from supporting substance (structural analogue or surrogate)</td>
<td>Scheerbaum D. (2010)</td>
</tr>
</tbody>
</table>

**Long-term toxicity to aquatic invertebrates:** NOT AVAILABLE  
**Long-term toxicity to fish:** NOT AVAILABLE
Toxicity to microorganisms:

<table>
<thead>
<tr>
<th>Method</th>
<th>Results</th>
<th>Remarks</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>activated sludge, domestic freshwater static EU Method C.11 (Biodegradation: Activated Sludge Respiration Inhibition Test) OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)</td>
<td>EC50 (3 h): 218.8 mg/L test mat. (nominal) based on: respiration rate</td>
<td>1 (reliable without restriction) key study experimental result read-across from supporting substance (structural analogue or surrogate)</td>
<td>Test material 4-MHHPA Fiebig S (2009)</td>
</tr>
</tbody>
</table>

PNEC sewage treatment plant

<table>
<thead>
<tr>
<th>Value Assessment factor</th>
<th>Remarks/Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNEC stp (mg/L)</td>
<td></td>
</tr>
<tr>
<td>2.19</td>
<td>100</td>
</tr>
</tbody>
</table>

Toxicity to terrestrial arthropods: NOT AVAILABLE
Toxicity to terrestrial plants: NOT AVAILABLE

12.2 Persistence and degradability

Biodegradation:

<table>
<thead>
<tr>
<th>Method</th>
<th>Results</th>
<th>Remarks</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test type: ready biodegradability activated sludge, non-adapted EU Method C.4-D (Determination of the &quot;Ready&quot; Biodegradability - Manometric Respirometry Test) OECD Guideline 301 F (Ready Biodegradability: Manometric Respirometry Test)</td>
<td>under test conditions no biodegradation observed % Degradation of test substance: ca. 2 after 28 d (O2 consumption)</td>
<td>1 (reliable without restriction) key study experimental result read-across from supporting substance (structural analogue or surrogate)</td>
<td>Test material 4-MHHPA Fiebig S. (2009)</td>
</tr>
</tbody>
</table>

MHHPA was considered not ready biodegradable

Persistence:
Upon contact with water and water vapour MHHPA hydrolyses to the corresponding dicarboxylic acid. A hydrolysis study according to OECD guideline no. 111 with the structural analogue 4-MHHPA was carried out and the half-life (DT50) at pH 7 and 12 °C was calculated to be 3.6 min. Thus, MHHPA as such is not persistent

12.3 Bioaccumulative potential

Bioaccumulation
The partition coefficient of the structural analogue 4-MHHPA was determined to a log Pow of 2.09 at 40 °C using the HPLC method in accordance with OECD guideline no. 107 and EU method A.8. The BCF of the substance has been estimated using accepted calculation methods (BCFBAF v.3.0) to give a value of 11.12 L/kg ww. As the substance is rapidly hydrolysed to the corresponding dicarboxylic acid, calculation of the BCF of the hydrolysis product has also been undertaken. The potential of bioaccumulation of the di-carboxylic acid degradation product is low, calculated to be 3.16 L/kg ww. In summary, with BCF values < 2000 for the substance as such and its degradation product, 4-MHHPA and MHHPA were considered not bioaccumulative.

12.4 Mobility in soil

Adsorption/desorption:

<table>
<thead>
<tr>
<th>Method</th>
<th>Results</th>
<th>Remarks</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study type: adsorption/desorption Calculation method</td>
<td>Adsorption coefficient: Koc: 91.94 LogKoc: 1.96</td>
<td>2 (reliable with restrictions) key study estimated by calculation read-across from supporting substance (structural analogue or surrogate)</td>
<td>Haynes G (2010b)</td>
</tr>
<tr>
<td>US EPA EPIWIN (v 4.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No data was available for MHHPA. Instead a read across approach was used, assessing data of 4-MHHPA. For 4-MHHPA, a Koc was estimated by QSAR calculation (US EPA EPIWIN, v4.0). The Koc was calculated to be 91.94 L/kg and a logKoc of 1.96.

Volatilization

The following table shows the results for volatilisation. MHHPA was not tested instead, read across approach was applied for estimation from 4-MHHPA, as these substances was considered to show similar environmental fate properties. 4-MHHPA was not tested for volatilisation. Calculation of the Henry’s Law Constant was performed by QSAR estimation. The results are summarised in the following table:

<table>
<thead>
<tr>
<th>Method</th>
<th>Results</th>
<th>Remarks</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPIWIN (v 4.0), HENRYWIN Program (v 3.20)</td>
<td>Henry's Law constant: 2.9 Pa m³/mol at 25 °C</td>
<td>2 (reliable with restrictions) key study estimated by calculation read-across from supporting substance (structural analogue or surrogate)</td>
<td>Haynes G (2010c)</td>
</tr>
</tbody>
</table>
12.5 Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

12.6 Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS
13.1 Waste treatment methods

Product In accordance with local and national regulations. The product should not be allowed to enter drains, water courses or the soil.

14. TRANSPORT INFORMATION
14.1 UN number

Land transport Not classified as dangerous in the meaning of transport regulations.

Sea transport Not classified as dangerous in the meaning of transport regulations.

Air transport Not classified as dangerous in the meaning of transport regulations.

15. REGULATORY INFORMATION
15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Regulations:

TSCA: All components are listed on the TSCA inventory.

SARA TITLE III

Acute: Yes
Chronic: Yes
Fire: No
Reactivity: Yes
Pressure: No

TSCA 12(b) Export Notification: Not Listed
California Proposition 65: Not Listed

European Regulations:

All components are listed on the EINECS.

EINECS Number: Methylhexahydrophthalic Anhydride: 247-094-1
Canadian Regulations:
All components are listed on the DSL.

Japanese Regulations:
All components are listed on the ENCS.
ENCS Number: Methylhexahydrophthalic Anhydride: 3-2450

Australian Regulations:
Methylhexahydrophthalic anhydride is not listed on the AICS.

Korean Regulations:
All components are listed on the ECL.
ECL Number: Methylhexahydrophthalic Anhydride: KE-18585

15.2 Chemical Safety Assessment
Available for MHHPA

16. OTHER INFORMATION
Date Created: 5/07/2014

Indication of danger:
Xn - harmful

R-phrases:
R41 - irritant; risk of serious damage to eyes
R42/43 - may cause sensitisation by inhalation and skin contact

S-phrases:
S2 - keep out of the reach of children
S22 - do not breathe dust
S24 - avoid contact with skin
S26 - in case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S37/39 - wear suitable gloves and eye/face protection

HMIS Hazard Rating
Health: 3 3 = High
Fire: 1 2 = Moderate
Reactivity: 1 1 = Slight
PPE rating to be supplied by user depending on use conditions.

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